

THE GOVERNMENT

AND

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THE PUBLIC WORKS.

BY

LEWIS M. HAUPT, C.E.

REPRINTED FROM LIPPINCOTT'S MAGAZINE FOR OCTOBER, 1887.

NOTE.—The accompanying paper is republished by its author, for the information of those who may be interested in the systematic development of our commercial highways, as exhibiting the conditions which restrict our growth and showing how they may be modified to advantage by the creation of a Department of Commerce and Industries.

PHILADELPHIA, PA.

1901.

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THE GOVERNMENT AND THE PUBLIC WORKS.*

BY LEWIS M. HAUPT, C. E.

FOUR years ago, or in August, 1883, there appeared in *Lippincott's Magazine* a paper by Frank D. Y. Carpenter, treating of the relations of the civil assistants in the Corps of Engineers to the government service. It may have been the modest protest of a class of employees against a real or an imaginary injustice, or it may have been a patriotic effort on the part of the writer to expose the defects of fortuitous legislation and suggest a remedy, but, whatever the purpose, the seed was sown, has taken root, and is already yielding fruit.

Numerous magazine articles, animated discussions in technical journals, leaders in the dailies, conventions of scientists, resolutions of societies, committees of investigation, committees for collating statistics and information, advisory councils, and in fact a large part of the political machinery of the government, have all aided in developing a growing interest in the important question which is believed to have been definitely introduced by that article.

The policy of the government towards its public civil works, and its relations to those intrusted with their execution, are subjects involving many important questions of history, methods, means, results, and future requirements, and to understand them we must unlock the wicket of the present with the key of the past, that we may obtain a vista of the future.

In the January (1886) number of the *Journal of the Association of Engineering Societies*, President L. E. Cooley shows, in a vigorous argument, that the United States has no "Rational Policy of Public Works;" in the May (1887) number of *The Forum*, General W. F. Smith explains the confusion that exists in various government departments, resulting in reduplication of work and jealous grasping after appropriations. The same facts are testified to by Major J. W. Powell, Director of the U. S. Geological Survey, in his evidence before the joint commission to reorganize the "Signal Service, Geological Survey, Coast and Geodetic Survey, and the Hydrographic Office of the Navy Department."

The interesting contribution by Mr. F. P. Powers to the July number of *Lippincott's Magazine* on "West Point, the Army, and the Militia" is another argument to show cause for progress in a more systematic development of the machinery of government administration. Were further proof of the need of a better system required, it is only necessary to refer to the toils and tribulations of the River and Harbor bill, to the odium which

* From *Lippincott's Magazine*, Oct., 1887, being a plea for a rational system of public improvements on a more permanent basis.

attaches itself thereto, despite the vigilance of its framers, to the serious losses to the country at large from its repeated failures to become a law, and to the depreciation of an important class of works and the demoralization of its *personnel* in such times of suspension.

The need of reorganization being conceded, it remains to determine the available resources and the manner of assembling and arranging them so as to produce more economic results. Here the horizon broadens and the paths of inquiry diverge: we may follow the *personnel* and its preparation, the *matériel* and its properties, the *service* and its requirements, the *legislation* and its methods, or the *finances* and their disbursements, but the short cut to the goal will be found in a consideration of the *defects of the present system and their remedies*.

And what is the present system of conducting the civil public works of the government?

It is in most instances a tentative, temporary, and temporizing policy, based upon appropriations made or withheld as circumstances may decree, and upon estimates which are generally greatly exaggerated to provide for such contingencies.

Some of the civil works for which appropriation bills are prepared are summarized by General Smith, as follows:

1. *The Improvement of Rivers and Harbors*, which, by precedent only, is in the hands of the Secretary of War, and carried on by the Engineer Corps of the Army.
2. *The Coast and Geodetic Survey*, under a bureau attached to the Treasury Department.
3. *The Geological Survey*, under the Interior Department.
4. *The Survey of Public Lands*, under the Interior Department.
5. *Public Buildings*, including court-houses, post-offices, mints, monuments, State and departmental offices, etc., mostly under the control of the Treasury Department.
6. *The Meteorological or Weather Bureau*, in the hands of the War Department, because the idea of collecting and uttering the data originated in the brain of a clever army officer, who organized the Signal Service of the army and became head of a bureau for its administration.
7. *The Agricultural Bureau*, belonging to the Department of the Interior.
8. *The Bureau for the Administration of the Light-House System*, which is an appendage to the Treasury Department.
9. *The National Observatory*, which, with its varied duties, is assigned to the Navy Department,—a disposition which could hardly be explained without going into a history of the passage of the law creating the bureau.
10. *The Bureau of Patents*, one of the largest and most important of the administrative bureaus of the government. This is under the Interior Department.
11. *The Inspection of Hulls and Boilers of Steamers*, under laws and regulations for the protection and preservation of life

and property afloat,—a branch controlled by the Treasury Department.

12. *The Bureau of Pisciculture.*

Such are the principal bureaus requiring the services of specialists and a technical training of a broad range, covering the mathematical, physical, and natural sciences with their applications. The incongruity of the assignments to the departments is at once apparent; and it may well be asked, why should the Treasury Department, which is supposed to consider only matters of finance, be expected to supervise and foster a bureau requiring the highest attainments in mathematics and geodesy, or in architectural design and construction, or in the erection and equipment of light-houses?

Again, why should one class of surveys be delegated to the Treasury, another to the Interior, another to the War, and a fourth to the Navy Department, when the principles underlying all are the same and the work could be far more economically performed under one head? or why should the purely civil works of opening up and improving the water-ways and harbors of the country be placed in the hands of the War Department and intrusted to officers whose training has been of a military and not of a civil character?

The existing condition is not the result of foresight and a well-digested, systematic plan for the execution of our public works. It is a mere chance, a growth which has been developed by the exigencies of public requirements; and now that it is seriously proposed to co-ordinate and systematize these bureaus, so as to increase their utility and efficiency, the ever-present spirit of conservatism says it cannot be done, because some of the political patronage dispensed under the present régime would be lost.

This may be a real difficulty, but we think upon further investigation it will be found imaginary. The statesmen who are most influential and who retain the respect and confidence of their constituents are those who, with broad and liberal views of their obligations not only to their districts but to the whole country, legislate for the general good, knowing that the greater includes the lesser. They are returned to their posts of honor term after term so long as they are willing thus to serve their country. It is unnecessary to cite instances.

The proposed reorganization does not reduce the amount of work to be performed, but, on the contrary, increases it, and at the same time removes many serious objections to present methods which render a large percentage of the appropriations utterly useless.

The same or larger amounts of money are expected to be appropriated, to be expended upon the same class of works, under the same honesty of administration, and in the same districts, but it is proposed to modify somewhat the manner of preparing the appropriation bills, so as to avoid the present objectionable methods of legislation, waste of time, danger of failure, local jealousies

and contests over items, and to relieve members from the reproach of not obtaining their *pro rata* of the total amount appropriated for their district. It is further proposed to consolidate the bureau, so as to avoid the duplication of numerous parts of the work, to reduce the *personnel* in some bureaus, that it may be available in others, and so to distribute the duties as to secure more permanent and efficient results, accompanied by a sense of personal responsibility which does not now prevail.

Having faith in the possibility of effecting a reorganization at no very distant date, let us proceed "to determine the available resources, and the manner of arranging them so as to produce more economic result," or, in other words, to discuss "the defects of the present system, and their remedies."

As our space will not admit of an analysis of all the bureaus on the list, it will suffice, by way of illustration, to consider but one. For that purpose let us take the first, which is that relating to the Improvement of Rivers and Harbors.

The first serious defect in this branch of the government service is, as intimated, in the manner of preparing the appropriation bill. The estimates for works in progress or for those recommended are submitted by the Chief of Engineers, through the Secretary of War, to Congress, and thence referred to the appropriate committee, composed of jurists, merchants, manufacturers, and other gentlemen of culture, but seldom, if ever, of engineers. Yet the excellent practical judgment of the members of this committee is an admirable substitute for a scientific training, and after months of arduous labor a bill is formulated and submitted which is as free from objectionable items as it is possible to have it. This bill may contain hundreds of items, some of which exceed a million of dollars, and it may include any of the navigable creeks, rivers, or harbors in the United States or Alaska. It is not to be expected that a committee of fifteen members, representing as many States, should possess so intimate a knowledge of the requirements of this vast field as to be able to make an entirely equitable or satisfactory allotment of the money to be expended. Without the facts embodied in definite surveys and plans before them, they must be guided by the opinions of others; and hence the influence of parties interested in promoting special, local, and independent improvements must largely prevail in deciding upon the importance of the item and the amount to be assigned to it. Due consideration must also be given to the probable increase in the number of items of the bill in the committee of the whole, as well as in the Senate and its committees, and also to the aggregate of the bill and the probable amount of the "horizontal reduction."

It is true that after a few years the members become well informed as to the relative merits of many of the improvements but the committee itself is not permanent, its *personnel* is continually changing, the policy of the government is often vacillating and it therefore frequently happens that works begun under one administration are neglected and permitted to decay by another or that improvements carried to completion are so situated as to

be of no service to the public, because they are inaccessible, the other links in the chain of improvements not having been made.

Such are a few of the defects in the method of securing the funds for river and harbor improvements. Those which are incidental to their expenditure may perhaps best be stated by a brief reference to the history of the works themselves, as shown by the laws relating to these matters, and by the inherent defects in the executive departments for conducting the works.

On the 11th of August, 1790, Congress passed an act ratifying certain acts of Maryland, Georgia, Rhode Island and Providence Plantation relative to their public improvements.

In 1798 it ratified an act of Massachusetts incorporating a private company to repair a pier at the mouth of the Kennebunk River.

In the year 1800 Georgia was authorized to collect a duty of three-pence per ton for "clearing the river Savannah."

Two years later certain light-houses and public piers were authorized to be constructed in the Delaware River, and thirty thousand dollars were appropriated for the purpose.

The funds for further improvements of the Delaware were authorized to be collected by the port wardens of Philadelphia levying a duty of four cents per ton, by an act passed February 28, 1806.

Again in 1816 Congress assented to an act of Virginia incorporating a company for the improvement of the James River.

On the admission of Alabama as a State, March 2, 1819, an act was passed authorizing the appropriation of five per cent. of the net proceeds of land sold after September, 1819, for public roads, canals, and the improvement of the navigation of its rivers.

The first appropriation for surveys of the Mississippi and its tributaries, amounting to nine thousand five hundred dollars, was passed April 14, 1820. The next year the Secretary of the Navy was authorized to expend one hundred and fifty dollars in removing obstructions from the mouth of the river Thames in Connecticut; and on the same date—March 3, 1821—the President was authorized and requested to cause examinations and surveys for light-houses to be made by "proper and intelligent persons;" also to have a pier repaired at Portsmouth, "by contract under the direction of the collector of the district."

The following year the responsibility of supervising these affairs was transferred to the Secretary of the Treasury, and on May 7, 1822, he was authorized to build, by contract to be approved by the President, a sea-wall at Smutty Nose and the break-water in Delaware Bay. In 1823 the authority to make several surveys was vested in the President, and he was authorized to employ one of the Topographical Engineers of the United States* for the survey of Presque Isle, Pennsylvania; for this purpose one hundred and fifty dollars were appropriated.

In the year 1824 several important acts were passed extending

* The United States Military Academy was organized in 1802.

the duties of the President with reference to public works, authorizing him to cause the necessary surveys, plans, and estimates to be made "of such roads and canals as he may deem of national importance," and "to employ two or more skillful civil engineers, and such officers of the corps of engineers, or who may be detailed to do duty with that corps, as he may think proper," also to provide the necessary "plant." On February 21, 1825, an appropriation was passed "for making surveys and carrying on the operations of the board of engineers." During this and the next year certain special bills were passed, and the Secretary of the Treasury was authorized to subscribe to the stock of the Louisville and Portland and of the Dismal Swamp Canal Companies.

Beginning with May 20, 1826, the policy of Congress appeared to be to assemble the sundry items into a general bill, which was passed annually, throughout the John Quincy Adams and Andrew Jackson administrations, until the year 1839, when only a few special appropriations were made. This condition of affairs continued until June 11, 1844, when the general bill was resumed and passed. This was succeeded by special bills and land-grants to States conducting public works until 1868, except in 1852, when a bill was passed for Western rivers. In 1868 the government once more returned to the general appropriation bill, and has adhered to it ever since, although the bill failed in 1869, 1877, 1883, 1885, and 1887, in consequence of the veto or of "short" sessions. The present method of conducting these public civil works probably dates from the act of March 2, 1867, which provided that "the Chief of Engineers may, with the approval of the Secretary of War, employ such civil engineers, not exceeding five in number, for executing the surveys and improvements of Western and Northwestern rivers, as may be necessary to the proper and diligent execution of the same." To-day the total number of officers in the Corps of Engineers is one hundred and nine; while the number of civil assistants is believed to be much greater.

From this *résumé* of the history it appears that the ways of communication, whether by land or water, have been under the supervision of the States, of custom-house officers, private companies and contractors, port wardens, the President, the Secretaries of the Navy, War, and Treasury Departments, and even of the Quartermaster-General.

It appears, then, that since about 1868 the execution of river and harbor works, which are purely of a civil character, and for which a special training is required, has been intrusted to the United States Corps of Engineers, a body educated for the performance of military service.

May we not, with propriety, inquire why the graduates of the Naval Academy are not assigned to similar civil duties, or why any other of the alumni of West Point or Annapolis are not placed in charge of works in other civil bureaus, as that of agriculture, for example, since they study chemistry, geology, and mineralogy, or in Patent-Office positions, since they have read mechanics and physics, or on the Geological or Coast Surveys, for similar rea-

sons? Again, we might ask, with reason, why selection is made only from the highest corps in the service, when all the cadets are put through the same course of studies and are graduated as proficient, and particularly in view of the fact that the best executive officers are not, as a rule, those who take the academic honors. Why should not the Ordnance, Artillery, Cavalry, or Infantry officers who are alumni of the Military Academy be placed in charge of civil works?

The first defect of the present system we find, then, to be the assignment of a class of military specialists to civil duties for which their academic training does not primarily adapt them. Another defect arises from the absence of the usual incentives to labor, and of personal responsibility as to results. This is an inherent evil due to the regulations of the War Department relative to stations, duties, and promotions in the corps. It is seldom that an officer remains in one place longer than four years: instances are on record where there have been as many as four or more changes in that time. This frequently involves a shifting of all the civil assistants, and at least the chief clerk, leaving but a few subordinates who may be familiar with the details of important works, and often changes the plans of the work, resulting in a waste of time and materials.

A good idea of the frequency of this kaleidoscopic change may be obtained from an exhibit of the dates of retirement of the ranking officers of the corps, which involves generally a movement all along the line, with some changes of stations.

The present Chief's term will expire in 1888, that of his successor in 1889, the next in 1891; five officers go out in 1895, one in 1896, one in 1897, one in 1899, one in 1900, three in 1901, etc.: so that there will be about an average of one change each year.

The time of the officers in charge is largely consumed in administration; their duties are varied, and their works often too remote from their stations. It not infrequently happens that an officer stationed at New York may be in charge of works extending from Florida to Long Island and from the source to the mouth of the Mississippi. Another stationed at New Orleans may be connected with works in New York or on the Great Lakes.

Another defect consists in the fact that the government makes no provision for educating specialists for these most important branches of the public service. The Military and Naval Academies are primarily for supplying officers for the army and navy, but of the members of the Corps of Engineers only the second and a few of the first lieutenants are assigned to purely military duties. These, with a few others, making twenty-two in all, are connected with the Engineers' School of Application and Battalion of Engineers at Willit's Point. Twenty-one officers are in charge of fortifications scattered over the United States, but all have civil duties to perform on river and harbor work in addition. This is generally true of the entire corps, excepting the second lieutenants: so that of the one hundred and nine members all but twelve may be said to be engaged on civil works.

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From these comparative exhibits and statements it would seem that, whilst the government makes no pretence of educating engineers for its civil service, it also fails, through its present method of administration, to secure the permanent services of those alumni of the civil institutions who are well trained to perform these most important duties. This also is a serious defect of the system.

It is manifest, therefore, that the remedies must lie in the direction of permanency of residence, individual responsibility for results, adequacy and certainty of appropriations, and a system of promotion based upon relative ability and not upon a military succession.

These results can readily be secured by dividing the country into topographical basins and assigning to each a chief engineer whose tenure of office shall be for life, subject to removal only for incompetency or misdemeanor. The first appointment should be made by the President from nominations made by the Chief of Engineers and the various engineering societies throughout the country. Subsequent appointments should be by promotion under the civil service rules from among the junior engineers of that residency. In this way only can a thorough knowledge of the physical, mechanical, commercial, and social elements be intimately united in an efficient, local, executive officer.

The chiefs of these districts should compose a Board to estimate and recommend the amount of money required to continue improvements in their districts, and should frame a bill for the total amount to be submitted to Congress; or the total amount required to complete any projected work may be submitted and appropriated payable in annual instalments by the Secretary of the Treasury. The salaries of such engineers should be sufficient to avoid all extras and contingencies, such as commutation for fuel and quarters, service-rations, mileage, etc.; but the actual expenses of travel should be allowed upon the certificate of the officer incurring them, as is done at present in some of the civil bureaus.

The topography of the United States readily admits of such a plan, which is similar to that existing in France,—a country not larger than the basin of the Ohio, yet its expenditure for river improvements and canals up to 1870 is estimated at \$240,000,000 which is more than double that of the entire United States, although the latter is fifteen times as large. The annual reduction in the price of articles of first necessity, due to the saving in cost of transportation in consequence of its river improvements, is stated at \$5,000,000. The population per square mile is over one hundred and eighty, while that of the Ohio basin is about forty. The expenditures for this latter district are less than \$10,000,000 and for the entire country, up to 1882, about \$111,000,000.

The relations of several of the bureaus as shown by their expenditures from 1789 to 1882 are as follows:

Public Buildings	\$88,135,270
Mints, etc.	5,373,000
Rivers and Harbors	111,300,000
Light-Houses and Beacons	78,778,000
Roads and Canals	19,890,000
Forts, Arsenal, and Armories	91,356,000
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	\$394,832,270

These might readily be grouped into two classes, viz., a Bureau of Transportation and a Bureau of Architecture. The last item, "Forts," etc., should be placed in a Bureau of Military Affairs. The various surveys now being conducted under four departments should be consolidated into a Bureau of Information and Surveys.

There is no reason why the graduates of the Military and Naval Academies should not be men selected from the best technical schools and colleges in the United States, instead of, as now, from so wide a limit as is permitted under the present low requirements for admission. As a matter of fact, some of the matriculates have completed a college course before entering, and hence have at once a great advantage over their classmates in the contest for standing and honors. Moreover, the time spent in repeating the more elementary parts of the course is virtually wasted in waiting for the less favored to overtake his more fortunate brother. If instruction were confined to purely military matters, and selection were made, after rigid examinations, from the alumni of civil institutions, the length of the course might be reduced to two or at most to three years, it could be made more thorough and technical, and a much larger amount of practical work could be done in chemistry, electrics, signaling, etc., with superior results as to scholarship and military skill and at much less expense to the government.

SUPPLEMENT, DECEMBER, 1901.

Since the publication of the above paper the frequent failures of the river and harbor bills, and the difficulties and expense of securing and maintaining deeper channels, have served to impress still more forcibly the necessity for a reorganization of this department of the public service. In an admirable paper published in *The Forum* of May, 1888, Senator Shelby M. Cullom stated:

"It has long been the settled policy of the general government to make appropriations from the public revenues for public works of the character indicated, yet no systematic and well-defined policy with respect to them has been adopted, and the methods in vogue are rather the result of chance than of deliberate legislative intention. * * * My investigation of the subject has led me to the conclusion that the difficulty with regard to our national public works is a fundamental one. The fault lies at the basis of the whole system; or rather, more properly speaking, the trouble is occasioned by the want of any comprehensive and well-considered

ered policy and system. The present practice is radically at fault, in that Congress reserves to itself alone the right to take the initiative in the inauguration of all river and harbor works. * * * New projects, however important, receive no consideration unless those most directly benefited bring them to the attention of Congress. * * * The engineers, following the ideas of military discipline in which they have been trained, naturally content themselves with carrying out their instructions, and are careful to go no further."

After referring to a number of defects of the present system the Senator goes on to say:

"Such methods are demoralizing in the highest degree, not only to Congress, but to the public; whatever will tend to do away with them will be a public blessing. Under existing conditions local and sectional influences are sure to predominate too largely. * * * The obvious and common sense remedy for the evils I have endeavored to point out would seem to be the complete transfer of the administrative functions now assumed by Congress to an organization for the special purpose of supervising and executing all public works on rivers and harbors."

He then goes on to formulate a plan which was embodied in a bill known as the Cullom-Breckinridge bill, which seemed to be premature. But the frequent failures of appropriations and the deterioration in works consequent thereon have served to impress still more forcibly the urgent need of reorganization. Year after year the National Board of Trade discusses and adopts resolutions urging greater efficiency and continuity in this class of improvements. The Southern Industrial Association, in June, 1901, adopted resolutions urging the creation of a permanent Board of Engineers to control the systematic improvements of our waterways. Some years ago a U. S. Senator, whose experience and services make him an authority on this matter and give his opinions unusual weight, remarked to a committee of engineers: "If a worse system than ours can be found on the face of the earth, I would like to know it."

In 1898 *The Journal of the Association of Engineering Societies* published a paper on "National Public Works," stating amongst many good arguments that "a system of national public works which admits of unseemly quarrels between departments as to which shall have charge of different works; which allows the discrediting of the work of one department by another and the duplication of work and consequent waste of funds; which promulgates such rules and regulations for its guidance that the cost of doing work and of disbursing the funds appropriated for its use is largely in excess of what it should be; whose members are liable to be court-martialed and to have their reputations and fortunes wrecked for not complying with regulations which it is probable that every officer in the corps is compelled to violate in order not to subject important works under their charge to serious delays and loss; * * * would seem to embody all of the conditions summarized in the distinguished Senator's statement,

that we have the worst system of national public works on the face of the earth."

Many of these defects it is now proposed to correct by the new Department of Commerce and Industries which Congress is now urged to create, and which the rapid development of the country appears to demand in the interest of economy. By this comprehensive bill many of the bureaus which have been attached to the several departments where they have no logical affinity will be co-ordinated under one head, which will effect large saving both in time and money, in reporting statistics or in securing results under a more permanent tenure of office and civil service promotions. This bill should receive the earnest support of every patriotic citizen of the United States who is an advocate of progress.

